



## Sligo County Council




## Proposed Public Park, Remediation and Restoration Works

## Engineering Planning Report

Job No: W21005  
Date: October 2021

**Contents Amendment Records****Document:** Engineering Planning Report**Project:** Proposed Public Park, Far Finisklin Road, Sligo**Client:** Sligo County Council**Job Number:****Prepared By:** Corwun O'Brien

Signed:

**Checked By:** Brian Mackey

Signed:

**Approved By:** Brian Mackey

Signed:

**Revision Record**

Revision	Date	Description	Prepared By	Checked By	Approved By
00	Oct 2021	Planning Issue	C O'Brien	B Mackey	B Mackey

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## 1.0 Introduction

This report is prepared in support of a planning application for the development of a proposed public park at Far Finisklin Road, Co. Sligo.

The Proposed Development will consist of the remediation, restoration and development of a public park at a 6.27 ha site located on the historic Finisklin Landfill site at Finisklin, Sligo, Co. Sligo. The works will include the following:

- Remediation works including the installation of six (6No) bio-windows and one (1No) bioactive-trench within the Site;
- Provision of a ca. 4.8ha public park including ca.1,000m long, ca.3.5m wide, walking track;
- Construction of a 18m<sup>2</sup> viewing platform to the north of the site;
- Construction of 750 m<sup>2</sup> car park, including 27 No. of car parking spaces and 10No. of bicycle parking spaces;
- Demolition of a 4m<sup>2</sup> single story concrete block hut;
- Modifications to the existing site entrance and new gates;
- Provision of a new pedestrian entrance to the west of the site;
- Associated ancillary works including land grading, drainage works, landscaping, fencing and seating areas.

Malone O'Regan Consulting Engineers, the firm appointed to provide civil and structural engineering services for the project, have compiled this report to address the engineering aspects of the application.

Engineering drawings submitted with the application are listed in Appendix A of this Report.

## 2.0 Proposed Development

### 2.1 The Site

The site is located 1.8km north west of Sligo Town Centre in the townland of Finisklin and is accessed from the Far Finisklin Road. The site is bound by Sligo Port and Industrial Units to the North East, tidal marsh lands to the north west, the Far Finisklin Road to the south and industrial units to the east.

The site is a former landfill site which will be remediated as part of the planned development. Site levels vary from 6.75m centrally in the site to 3.0m along the north eastern boundary and 5.0 m– 4.0m to the north and south of the site respectively.

### 2.2 Existing Services

An existing storm sewer, watermain, electrical ducting and an overhead telecom line are located in the Far Finisklin Road to the south of the site. It is planned to discharge the storm water from the site to the existing storm sewer on the road. A connection to the electrical ducting to serve the EV charging points is also planned. No other services connections are required to serve the site. Provision for future connections to a fibre network and public lighting are provided by the inclusion of ductwork throughout the development for future fibre cable and lighting ductwork supply.

### 3.0 Storm Water Drainage

The surface water from the car park and footpath surrounding the carpark area will be collected in a surface water sewer consisting of 160mm diameter pipes. The proposed storm water network includes an underground attenuation tank, hydrobrake and fuel / oil separator. A new manhole, MH S04 that connects the proposed sewer to the existing public sewer will be located at the entrance to the development. The proposed storm sewer will discharge to MH S04 at a controlled rate of max 0.9 l/s from the site. Prior to discharge from the site the storm water flows through an underground attenuation tank, a fuel / oil separator to remove hydrocarbons and silt and a hydrobrake which limits the discharge to 0.9l/s. The existing public sewer on the Far Finisklin Road is laid at 1:800 and has adequate capacity to cater for the proposed discharge rate of 0.9 l/s.

The surface water drainage details are indicated on drawing W21005-P806 Rev P.

#### 3.1 Sustainable Drainage Systems (SuDS)

##### *Allowable Site Discharge and Surface Water Attenuation*

Calculations are included in Appendix C and D for the surface water drainage and attenuation. The rainfall intensities are based on Met Eireann figures for Sligo Town. The Met Eireann figures include 30 and 100 year return periods and we have used these figures to establish the volume of attenuation required. An allowance of 30% increase in rainfall has been included in the design to account for climate change as specified in the Sligo County Council Development Plan 2017 - 2023. The Met Eireann rainfall data figures are included in Appendix B. The location of the attenuation arrangement is indicated on drawing W21005-P806 Rev P.

From the attached calculations for the surface water attenuation system in Appendix C it can be seen that the critical storm durations for the 30 year return period is the four hour storm, the volume of storage required is **33m<sup>3</sup>** and for the 100 year return period is the six hour storm, the volume of storage required is **48m<sup>3</sup>**. A “hydrobrake” with a suitable orifice size will be installed after the attenuation tank to restrict the discharge flow to 0.9 l/sec. This is calculated from the Greater Dublin Strategic Drainage Strategy (GDSDS) and in line with best practice.

It is proposed to use a Stormtech attenuation system with dimensions of approximately 11.0m long, 6.25m wide and 1.1m deep. This tank has capacity to store 51m<sup>3</sup>. The tank is designed to store the 1:100 year rainfall fall event underground.

A calculation sheet for the surface water sewer system is detailed in Appendix D. This should be read in conjunction with the drainage drawing for the development, see drawing W21005-P806 Rev P. The pipes have been designed for a rainfall intensity of 50 mm/hour, which equates to the peak 1 hour rainfall with a 100 year return period allowing 30% extra for climate change.

#### 4.0 Services – Foul Drainage, Water Supply, Lighting, Telecomms

- **Foul water:** There is no requirement for a foul sewer system for the development.
- **Water supply:** A water supply is not required for the proposed development.
- **Lighting:** Infrastructure (ducting) for the installation of public lighting at a future date is included in this application. Design, layout and specification for the public lighting is not included in the scope of this application.
- **Telecomms:** Infrastructure (ducting) for the installation of fibre optic cable at a future date is included in this application.

#### 5.0 Flood Risk Assessment

Due to the coastal location of the development a Stage 1 flood risk assessment was carried out using the method outlined in the publication The Planning System and Flood Risk Management Guidelines for Planning Authorities – November 2009.

##### Stage 1 – Flood Risk Identification

Using available resources, a desktop study was undertaken to assess the potential for the site to experience a flood event. The following information was used during the study:

- OPW – [www.floodinfo.ie](http://www.floodinfo.ie) – Interactive Flood Maps to view flood hazard and flood risk information
- OPW – Flood Risk Management Plan 2018 – Sligo Bay and Drowse

Map information for river and coastal flood events were viewed for the proposed site area. The river flood map for low, medium and high probability fluvial flood events were assessed. The map confirms that fluvial food is not a concern for the site.

The coastal flood maps for low, medium and high tidal flood events were also viewed. The coastal map confirms that medium and high probability tidal flood events do not impact on the proposed site. The low probability tidal flood map (refer to Fig 5.0) shows a small portion of the site along the Far Finisklin Road that may potentially flood by the sea in a very extreme flood event. This low probability flood event is noted as having an indicative 1:1000 chance of occurring or being exceed in any given year, which is referred to as an Annual Exceedance Probability (AEP) of 0.1%.

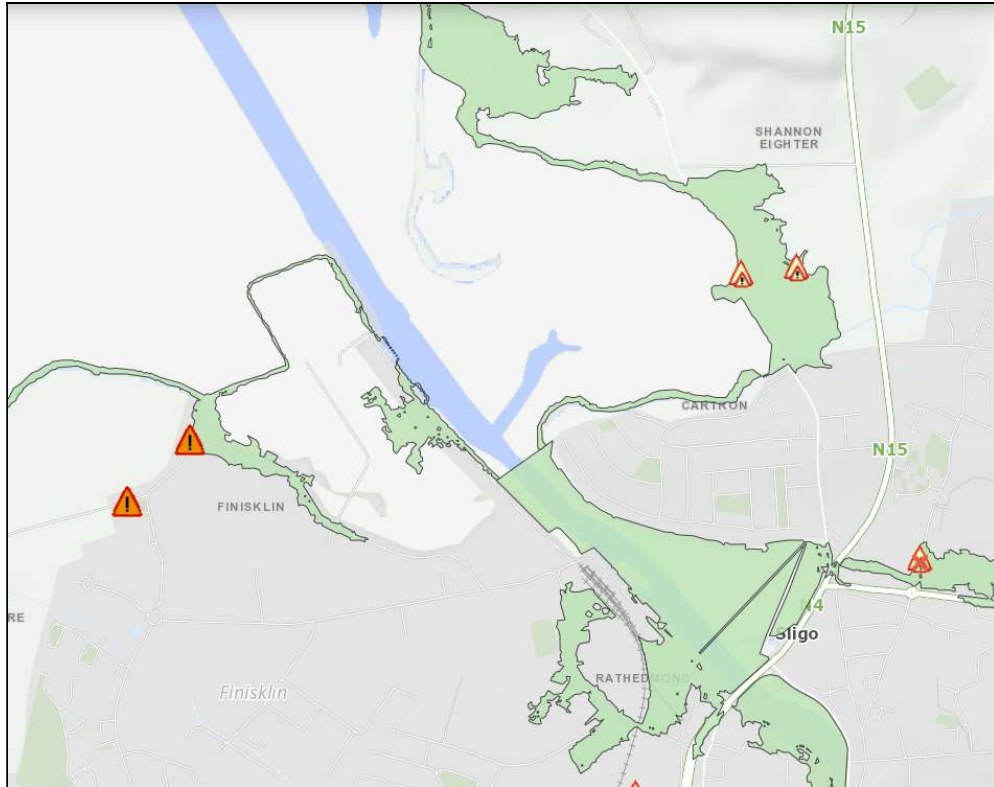


Fig 5.0: Extract from OPW Flood Maps indicating the extent of a 1:1000 year Coastal Flood Event

The information reviewed during the Stage 1 Flood Risk Assessment identifies a slight risk of coastal flooding during a very extreme flood event on the site. Taking into accounting the low probability and localised flooding to the southern boundary and the type of the development the risk would be deemed acceptable from a flood risk perspective. The proposed development is considered a ‘water compatible development’ as noted in Table 3.1 of The Planning System and Flood Risk Management Guidelines for Planning Authorities – November 2009 – refer to Fig 5.1 below. The risk of flooding in such an extreme event is considered acceptable therefore a **Stage 2 - Initial Flood Risk Assessment** and **Stage 3 - Detailed Risk Assessment** was not required for the proposed development.

<p><b>Water-compatible development</b></p>	<p>Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>
<p>*Uses not listed here should be considered on their own merits</p>	
<p>Table 3.1 Classification of vulnerability of different types of development</p>	

Fig 5.1: Water Compatible Developments

The OPW Flood Risk Management Plan for Sligo Bay and Drowse 2018 was reviewed. The Management Plan does not note the site as an area that is subject to flooding due to fluvial or tidal flooding.


## **6.0 Road Safety and Sight Lines**

The site is accessed via the Far Finisklin Road via an existing entrance. The site access is within a 50km/hr speed limit zone. In accordance with Transport Infrastructure Ireland's (TII) publication Rural Road Link Design DN-GEO-03031 April 2017 a minimum stopping sight distance of 90m has been achieved to the east and west of the site entrance. The 90m safe stopping sight distance is achieved using a 3.0m set back from the edge of the carriageway. The 90m sightlines are indicated on drawing P806 Rev P.



# Appendix A

## Engineering Drawings List

 <b>MALONE O'REGAN</b> CONSULTING ENGINEERS	3-4 Canada Street, WATERFORD. V52K. <i>Drawings Issued from Waterford Office</i>	Tel : +353 51 876 855 X91	2B Richview Office Park, Tel : +353 1 2602655 Clonskeagh, DUBLIN 14. D14 XT57	Sheet No.  <b>01</b>
	Email : waterford@morce.ie		Email : dublin@morce.ie	
<b>DRAWING ISSUE FORM</b>				
Job No :	Job :	Date Issued		
<b>W21005</b>	FINISKLIN PUBLIC PARK	Day	01	
		Month	11	
		Year	21	
Drawing No.	Drawing Title	Revision No.		
P800	Site Location Map (1:10,560)	P		
P801	Site Location Map (1:2,500)	P		
P802	Existing Site Layout (1)	P		
P803	Existing Site Layout (2)	P		
P804	Proposed Site Layout (1)	P		
P805	Proposed Site Layout (2)	P		
P806	Proposed Site Entrance Plan	P		
P807	Proposed Site Sections (1)	P		
P808	Proposed Site Sections (2)	P		
P809	Proposed Site Services	P		
P810	Structure to be Demolished	P		
P811	Biowindow & Biotrench Details	P		
P815	Site Development Details (1)	P		
P816	Site Development Details (2)	P		
P817	Site Development Details (3)	P		
Issued to :	No. of Copies			
Client	Sligo County Council	X		
Contractor				
Architect				
Quantity Sur.				
M&E Cont.				
Others				
Others				
Others				
Purpose of Issue :	PL			
Issue Method :	H			
Issued by :	SF			
Purpose of Issue				
PR = Progress/Preliminary	PL = Planning	F = Fire Cert	T = Tender	C = Construction
G = General				
Issue Method				
H = Hardcopy	E = Email	CD = Compact Disc	D = Floppy Disc	

# Appendix B

## Rainfall data

Met Eireann  
Return Period Rainfall Depths for sliding Durations  
Irish Grid: Easting: 167703, Northing: 337112,

DURATION	Interval	Years													
		2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	6months, 1year,	4.1,	4.9,	5.4,	5.8,	7.2,	8.7,	9.6,	11.0,	12.2,	13.1,	14.6,	15.7,	16.6,	N/A,
10 mins	2.6,	5.7,	6.8,	7.6,	8.1,	10.0,	12.1,	13.4,	15.3,	17.0,	18.3,	20.3,	21.9,	23.1,	N/A,
15 mins	3.6,	6.7,	8.0,	8.9,	9.6,	11.8,	14.2,	15.8,	18.0,	20.0,	21.6,	23.9,	25.7,	27.2,	N/A,
30 mins	4.2,	8.7,	10.3,	11.4,	12.2,	14.9,	17.9,	19.8,	22.5,	24.8,	26.7,	29.4,	31.6,	33.3,	N/A,
1 hour	5.6,	11.3,	13.3,	14.6,	15.6,	18.9,	22.5,	24.8,	28.0,	30.8,	32.9,	36.2,	38.7,	40.8,	N/A,
2 hours	7.4,	14.7,	17.2,	18.8,	20.0,	23.9,	28.3,	31.0,	34.9,	38.2,	40.7,	44.6,	47.6,	50.0,	N/A,
3 hours	9.8,	17.1,	19.9,	21.7,	23.1,	27.5,	32.3,	35.4,	39.6,	43.3,	46.1,	50.4,	53.6,	56.3,	N/A,
4 hours	11.5,	19.1,	22.1,	24.1,	25.6,	30.3,	35.5,	38.9,	43.4,	47.4,	50.4,	54.9,	58.4,	61.2,	N/A,
6 hours	13.0,	22.2,	25.6,	27.8,	29.5,	34.9,	40.6,	44.3,	49.4,	53.7,	57.0,	62.0,	65.8,	68.9,	N/A,
9 hours	15.3,	25.9,	29.7,	32.2,	34.1,	40.0,	46.5,	50.6,	56.1,	60.9,	64.6,	70.0,	74.2,	77.6,	N/A,
12 hours	18.0,	28.8,	33.0,	35.7,	37.7,	44.2,	51.1,	55.5,	61.5,	66.6,	70.5,	76.3,	80.8,	84.4,	N/A,
18 hours	20.2,	33.5,	38.2,	41.3,	43.6,	50.8,	58.4,	63.3,	69.9,	75.5,	79.8,	86.2,	91.0,	95.0,	N/A,
24 hours	26.6,	42.4,	48.2,	51.7,	54.8,	63.3,	72.4,	77.6,	84.3,	89.5,	94.0,	103.3,	107.3,	111.4,	N/A,
2 days	34.8,	47.0,	52.7,	56.4,	59.1,	67.6,	76.4,	81.9,	89.3,	95.6,	100.3,	107.3,	112.5,	116.7,	130.9,
3 days	41.8,	55.4,	61.6,	65.5,	68.5,	77.5,	86.9,	92.8,	100.5,	107.1,	112.0,	119.2,	124.6,	129.0,	143.5,
4 days	48.2,	62.9,	69.6,	73.8,	77.0,	86.6,	96.5,	102.6,	110.7,	117.5,	122.6,	130.1,	135.7,	140.2,	155.0,
6 days	60.1,	76.7,	84.2,	88.9,	92.4,	102.9,	113.7,	120.4,	129.1,	136.4,	141.8,	149.8,	155.7,	160.4,	176.0,
8 days	71.1,	89.5,	97.6,	102.7,	106.5,	117.9,	129.5,	136.5,	145.8,	153.5,	159.2,	167.6,	173.8,	178.8,	195.1,
10 days	81.6,	101.5,	110.2,	115.7,	119.7,	131.9,	144.2,	151.6,	161.4,	169.5,	175.5,	184.3,	190.7,	195.9,	212.8,
12 days	91.7,	113.0,	122.3,	128.1,	132.4,	145.2,	158.1,	165.9,	176.2,	184.6,	190.9,	200.0,	206.7,	212.0,	229.5,
16 days	111.3,	135.1,	145.4,	151.8,	156.5,	170.5,	184.6,	193.0,	204.0,	213.1,	219.8,	229.5,	236.7,	242.3,	260.8,
20 days	130.3,	156.3,	167.5,	174.4,	179.5,	194.5,	209.6,	218.6,	230.3,	239.9,	247.0,	257.2,	264.8,	270.7,	290.1,
25 days	153.4,	182.0,	194.1,	201.6,	207.1,	223.3,	239.5,	249.1,	261.6,	271.8,	279.3,	290.1,	298.1,	304.4,	324.7,

NOTES:

N/A Data not available

These values are derived from a Depth Duration Frequency (DDF) Model

For details refer to:

'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin', Available for download at [www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies\\_TN61.pdf](http://www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf)

# Appendix C

## Attenuation Tank Calculations

**INPUT SHEET FOR ATTENUATION CALCULATIONS**

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Job No. W21005

Job Name: Finisklin Sub-Urban Park

Date: August 2021

**Percolation Factors**

Roofs	=	0.85	
Concreted / Paved Areas		0.80	
Roads / Car Parks	=	0.80	
Grass / Landscaped	=	0.02	
<b>Total Development Area</b>		<b>1,275</b>	(m <sup>2</sup> )
		0.13	Ha

**Division of Areas****Roof**

Roof		-	
<b>Total</b>		<b>-</b>	(m <sup>2</sup> )

**Concreted Areas**

Concrete Paths		270	
<b>Total</b>		<b>270</b>	

**Roads**

Roads		860	
<b><u>Total Road &amp; Car Park</u></b>		<b>860</b>	(m <sup>2</sup> )

**Landscaped Area**

Landscaping		145	
<b>Total Landscaped</b>		<b>145</b>	(m <sup>2</sup> )

**INPUT SHEET FOR ATTENUATION CALCULATIONS**

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Job No. W21005 Job Name: Finisklin Sub-Urban Park

Date: August 2021

**Average Percolation factor**

$$= \frac{\text{Roof Area} \times 0.85 + \text{Conc. \& Paved} \times 0.80 + \text{Blacktop} \times 0.80 + \text{Landscaped Area} \times 0.02}{\text{Total Area for Development}}$$

$$= \frac{- \times 0.85 + 270 \times 0.80 + 860 \times 0.80 + 145 \times 0.02}{1,275}$$

$$= \frac{907}{1,275}$$

$$= 0.711$$

**Effective Area**

$$= \text{Total Area for Development} \times \text{Percolation factor}$$

$$= 1,275 \times 0.7113$$

$$= 907 \text{ m}^2$$

Typical calculation of Permissible Discharge based on 30min storm,  
30 year return period  
Allowed Discharge from Site

$$QBAR = 0.00108 \times (\text{AREA})^{0.89} \times (\text{SAAR})^{1.17} \times (\text{SOIL})^{2.17}$$

$$QBAR = 0.891 \text{ l/s}$$

Obtained from Mett Eireann  
Average Annual Rainfall Data = 25.75 mm

Average Percolation Factor  
from previous calculations = 0.711 mm

**Volume of Stormwater** = Site Area (m<sup>2</sup>) x Rainfall (m) x Average Percolation factor  
= 1,275 x 0.02575 x 0.711 = 23.352675 m<sup>3</sup>

**Volume of Discharge** = Permissible Discharge x time  
= 0.89 l/s x 60 sec x 30 min = 1604.6746 l  
= 1.605 m<sup>3</sup>

**Storage Required** = 23.353 - 1.605 = 21.748 m<sup>3</sup>

**INPUT SHEET FOR ATTENUATION CALCULATIONS**

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Job No. W21005

Job Name: Finisklin Sub-Urban Park

Date: August 2021

**30** year return period

Storm Duration (hrs)	Rainfall * (mm)	Volume X Perc Factor (m <sup>3</sup> )	Discharge (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
0.25	20.54	18.628	0.802	17.825
0.5	25.74	23.344	1.605	21.739
1	32.24	29.238	3.209	26.029
2	40.3	36.548	6.419	30.129
4	50.57	45.862	12.837	<b>33.025</b>
6	57.59	52.228	19.256	32.972
12	72.15	65.433	38.512	26.921
24	90.35	81.938	77.024	4.914
48	102.75	93.184	154.049	-60.865

\* Rainfall data includes 30% allowance for Climate Change

Standard Average Annual Rainfall = **1260** mm (met eireann)Soil Index = **0.3****100** year return period


Storm Duration (hrs)	Rainfall * (mm)	Volume X Perc Factor (m <sup>3</sup> )	Discharge (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
0.25	28.08	25.466	0.802	24.663
0.5	34.71	31.478	1.605	29.874
1	42.77	38.788	3.209	35.579
2	52.91	47.984	6.419	41.565
4	65.52	59.420	12.837	46.583
6	74.1	67.201	19.256	<b>47.945</b>
12	91.65	83.117	38.512	44.605
24	113.36	102.806	77.024	25.782
48	130.39	118.251	154.049	-35.798

\* Rainfall data includes 30% allowance for Climate Change



# Appendix D

## Surface Water Sewer Calculations

CALCUATING SHEET FOR SURFACE WATER					 MALONE O'REGAN CONSULTING ENGINEERS				
Malone O'Regan Consulting Engineers 3 - 4 Canada Street Waterford		<b>Tel:</b> 051 876855 <b>Fax:</b> 051 876828 <b>e-mail:</b> waterford@morce.ie			<b>Job:</b>	Public Park at Far Finisklin Rd, Sligo			
					<b>Job No:</b>	W21005			
					<b>Sheet No:</b>	1			
					<b>Ref to Drg No:</b>	P806			
					<b>Prepared By:</b>	CO'B			
					<b>Checked By:</b>	BM			
					<b>Client:</b>	Sligo County Council			
PIPE RUN	IMPEREABLE AREA (ha)	CUM. IMPEREABLE AREA (ha)	FLOW (Q) (L/s)	PIPE Ø (mm)	GRADIENT	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	
S01 - Att Tk	0.040	0.040	5.49	160	1:80	3.5	25.41	1.44	
Att Tk - S02	0.032	0.072	10.00	160	1:80	8.2	25.41	1.44	
S02 -S03	0.010	0.081	11.32	160	1:70	2.5	27.24	1.54	
S03 - S04*	0.002	0.084	0.90	160	1:80	8.8	25.41	1.44	
* Manhole S04 restricts flow to 0.9 l/s									